PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-296208

(43)Date of publication of application : 29.10.1999

(51)Int.Cl. G05B 15/02
H01L 21/02
// B23Q 41/08

(21)Application number : 10-097126

(22)Date of filing : 09.04.1998

(71)Applicant : OKI ELECTRIC IND CO LTD

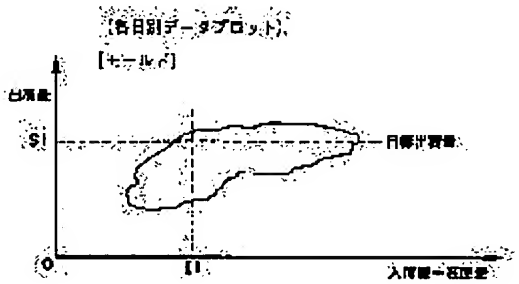
(72)Inventor : KUDO ISAO

(54) PRODUCTION MANAGEMENT INFORMATION OUTPUT DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To output effective information for shortening production TAT without reducing the shipment of semiconductor products.

SOLUTION: A production progress management system calculates the processing results of respective processes, the inventory of work in process (= arrival + inventory) of respective processes, etc., as an information indicating the states of manufacturing lines. Shipment data to 'arrival + inventory' in each prescribed period (e.g. a day) in each process are plotted on a graph and displayed on a data display terminal as a graph in each process. While observing the graph plotting the shipment to the 'arrival + inventory', a production manager detects the reach of the shipment to its limit even when 'arrival + inventory' is increased, sets up an objective shipment S1 near the reach of the shipment to the limit and can limit the 'arrival + inventory' within a range capable of obtaining the objective shipment S1. For instance, the 'arrival + inventory' can be set up to '11'.



LEGAL STATUS

[Date of request for examination] 08.03.2005

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The production-control information output unit which has the 1st output means which outputs the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on the amount information of arrival of goods, the inventory information, and the shipment information which were collected by the 1st information-gathering means which collects the amount information of arrival of goods, the inventory information, and the shipment information for every predetermined period about each process of semiconductor manufacture, and said 1st information-gathering means.
[Claim 2] The 2nd information gathering means which collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process, The operation information for every facility collected by said 2nd information gathering means, processing start time information, It is based on said amount information of arrival of goods, inventory information, and shipment information at processing end time information and a list. The production-control information output unit according to claim 1 which has further the 2nd output means which outputs the graph which plotted three kinds of data, the shipment and the facility non-operating time over the sum of the amount of arrival of goods in each process, and an inventory, and average production turn around time, for every process.
[Claim 3] The production-control information output unit according to claim 2 which has further the 3rd output means which outputs each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes for every process based on the operation information, processing start time information, and processing end time information for said every facility.
[Claim 4] A judgment means to judge whether there is any unsettled inventory of the product which this facility processes when a facility stops, or there is nothing, The non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory when it sets up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator when there is an unsettled inventory and there is no unsettled inventory, and a setting means to set up, The production-control information output unit according to claim 2 or 3 which has further the 4th output means which outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory.
[Claim 5] An excess judging means to judge whether the inventory permissible dose for every process to which the sum of the amount of arrival of goods and an inventory was beforehand set at each process was exceeded, A production-control information output unit given in any 1 term of claim 1 which has further an information means to report that the sum of the amount of arrival of goods and an inventory exceeded the inventory permissible dose at the process of relevance when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose at at least one process thru/or claim 4.
[Claim 6] The production-control information output unit according to claim 5 which it has further in the input means for inputting excess factor information, a storage means memorize the excess factor information that it was inputted, and the 5th output means that outputs the graph with which the inventory excess generating number of cases for every excess factor within a predetermined period expresses based on the memorized excess factor information when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to a production-control information output unit, and relates to the production-control information output unit which outputs the various information for performing the production control of a semi-conductor in more detail.
[0002]
[Description of the Prior Art] In recent years, the technique of a semi-conductor product is progressing very quickly, and the cycle of the technological innovation of a semi-conductor product is very short compared with other electric products. For this reason, about production of a semi-conductor product, it is very strong to shorten that production turn around time (for Production TAT to be called hereafter), and it has come to ask.
[0003] In the production status control of the present semi-conductor product, a certain same batch in a production facility was summarized as a lot, and the production TAT for every lot has been grasped based on the processing start time and processing end time of each process for every lot, and the inventory and the amount of processing track records of an unsettled product in each process are grasped.
[0004]
[Problem(s) to be Solved by the Invention] However, the factor which influences the production TAT of a semi-conductor product was difficult for grasping correctly the various factors for every above-mentioned process for every process, only by grasping the production TAT for every lot like the production status control of the above-mentioned semi-conductor product, since it is various. Moreover, in order to aim at compaction of Production TAT, without reducing the shipment of a semi-conductor product, it was also difficult to acquire a solution with appropriate producing a semi-conductor product by the production [what] TAT.
[0005] This invention is accomplished in order to cancel the above-mentioned trouble, and it aims at offering the production-control information output unit which can output useful information when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0006]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, a production-control information output unit according to claim 1 The 1st information gathering means which collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture, It is characterized by having the 1st output means which outputs the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on the amount information of arrival of goods, inventory information, and shipment information which were collected by said 1st information gathering means.
[0007] Moreover, a production-control information output unit according to claim 2 The 2nd information gathering means which collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process in a production-control information output unit according to claim 1, The operation information for every facility collected by said 2nd information gathering means, processing start time information, It is based on said amount information of arrival of goods, inventory information, and shipment information at processing end time information and a list. It is characterized by having further the 2nd output means which outputs the graph which plotted three kinds of data, the shipment and the facility non-operating time over the sum of the amount of arrival of goods in each process, and an inventory, and average production turn around time, for every process.
[0008] Moreover, a production-control information output unit according to claim 3 is characterized by having further

the 3rd output means which outputs each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes for every process based on the operation information, processing start time information, and processing end time information for said every facility in a production-control information output unit according to claim 2.

[0009] Moreover, a production-control information output unit according to claim 4 In a production-control information output unit according to claim 2 or 3, when a facility stops A judgment means to judge whether there is any unsettled inventory of the product which this facility processes, or there is nothing, The non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory when it sets up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator when there is an unsettled inventory and there is no unsettled inventory, and a setting means to set up, It is characterized by having further the 4th output means which outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory.

[0010] Moreover, a production-control information output unit according to claim 5 In a production-control information output unit given in any 1 term of claim 1 thru/or claim 4 An excess judging means to judge whether the inventory permissible dose for every process to which the sum of the amount of arrival of goods and an inventory was beforehand set at each process was exceeded, When the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose at at least one process, it is characterized by having further an information means to report that the sum of the amount of arrival of goods and an inventory exceeded the inventory permissible dose at the process of relevance.

[0011] Moreover, a production-control information output unit according to claim 6 The input means for inputting excess factor information in a production-control information output unit according to claim 5, when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose, It is characterized by having further a storage means to memorize the excess factor information that it was inputted, and the 5th output means which outputs the graph showing the inventory excess generating number of cases for every excess factor within a predetermined period based on the memorized excess factor information.

[0012] In the production-control information output unit of the claim 1 above-mentioned publication, the 1st information gathering means collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture. In addition, as a predetermined period, one day, two days, or one week is sufficient. And from the amount information of arrival of goods, inventory information, and shipment information which were collected, the 1st output means acquires the information on a shipment over the sum (it is hereafter written as a (amount of arrival of goods + inventory)) of the amount of arrival of goods in a predetermined period, and an inventory, and outputs the graph (it illustrates to drawing 4) which plotted the shipment to the (amount of arrival of goods + inventory) in each process for every process.

[0013] Although the graph about a mold process was shown in drawing 4 The graph which plotted the receiving shipment is seen. the production-control person of a semi-conductor product -- being such (amount of arrival of goods + inventory) -- The place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) is detected. For example, the target shipment S1 can be set up in the neighborhood the place where this shipment is reaching the ceiling like drawing 4 , and a (amount of arrival of goods + inventory) can be extracted in the range in which this target shipment S1 is obtained (for example, a (amount of arrival of goods + inventory) can be set as I1).

[0014] Thus, the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process outputted by the 1st output means is information useful when aiming at compaction of production turn around time (production TAT), without reducing the shipment of a semi-conductor product. That is, according to invention according to claim 1, useful information can be outputted when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.

[0015] Next, in a production-control information output unit according to claim 2, the 2nd information gathering means collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process. In addition, the hour entry and the downtime information on this facility that processing which relates to product production for example, with this facility is performed, its failure factor information, etc. are included in the operation information for every facility here.

[0016] And the 2nd output means acquires the information on the facility non-operating time over the (amount of arrival of goods + inventory) in each process from the operation information for every facility by which collection was carried out [above-mentioned] while acquiring the information on a shipment over the (amount of arrival of goods +

inventory) in each process, as mentioned above based on the amount information of arrival of goods, inventory information, and shipment information. Moreover, the information on the average production TAT over the (amount of arrival of goods + inventory) in each process is acquired from the processing start time information and processing end time information by which collection was carried out [above-mentioned]. And the graph which plotted the shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT is outputted for every process.

[0017] Although the graph of the average production TAT of as opposed to a (amount of arrival of goods + inventory) for the graph of the facility non-operating time [as opposed to a (amount of arrival of goods + inventory) for the graph of the shipment to a (amount of arrival of goods + inventory)] was illustrated to drawing 8 (C) at drawing 8 (A) at drawing 8 (B), respectively The production-control person of a semi-conductor product detects the place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) from the graph of drawing 8 (A). The place which reduces a (amount of arrival of goods + inventory), and the facility non-operating time begins to increase from the graph of drawing 8 (B) can be detected, and the place which increases a (amount of arrival of goods + inventory), and the average production TAT begins to increase from the graph of drawing 8 (C) can be detected.

[0018] Thereby, a production-control person can set up a (amount of arrival of goods + inventory) in the place which can secure a shipment above to some extent, suppressing low the facility non-operating time and the average production TAT (for example, a (amount of arrival of goods + inventory) can be set as I2). thus, according to invention according to claim 2, the average production TAT can be shortened, securing the above shipment to some extent suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.

[0019] Next, in a production-control information output unit according to claim 3, the 3rd output means acquires the information on the production TAT at each process from processing start time information and processing end time information, and acquires the information on the process reality working hours in each process from the operation information (time amount which is performing processing which relates to product production with this facility) for every facility. By subtracting process reality working hours from the production TAT at each process, the non-[within a process] working hours in each process are acquired. Moreover, the product transit time between processes between these two processes is acquired from the processing end time information on one process, and the processing start time information on the following process.

[0020] And the 3rd output means outputs each information on the process reality working hours in each process acquired by doing in this way, non-[within a process] working hours, and the product transit time between processes for every process. For example, the bar graph for every process with which the unit of an axis of ordinate was made into time amount like drawing 9 may be outputted, and the unit of an axis of ordinate may output the bar graph for every process made into the ratio (%) like drawing 10 . In addition, what is necessary is to specify beforehand whether it considers as the information on the process in front of migration, or it considers as the information on the process immediately after migration, and just to follow this convention in it about the product transit time between processes.

[0021] It becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes (for example, is it in the PD between processes, or is in the facility within a process?). That is, according to invention according to claim 3, useful information can be outputted when judging where the inhibition factor of production capacity is.

[0022] Next, in a production-control information output unit according to claim 4, a judgment means judges whether there is any unsettled inventory of the product which this facility processes, or there is nothing, when a facility stops. If a setting means will be set up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator if there is an unsettled inventory here, and there is no unsettled inventory, it will set up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory.

[0023] And the 4th output means outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory (it illustrates to drawing 11 R> 1).

[0024] The information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator and the non-operating time depended on the waiting for an unsettled inventory can be acquired without this waiting for the input of the non-worked factor (are they the waiting for an operator, or unsettled inventory waiting?) about the facility non-operating time by the operator like before. When the

ratio of the non-operating time depended on the waiting for an operator is high, the number of the operators stationed to Rhine is made to increase, and this information enables it to correspond improving PD control etc. exactly and promptly, when the ratio of the non-operating time depended on the waiting for an unsettled inventory is high.
[0025] Next, in a production-control information output unit according to claim 5, it judges whether the excess judging means exceeded the inventory permissible dose for every process to which the (amount of arrival of goods + inventory) was set beforehand at each process. Here, if the (amount of arrival of goods + inventory) is over an inventory permissible dose at at least one process, an information means will report that the (amount of arrival of goods + inventory) exceeded the inventory permissible dose at the process of relevance.
[0026] Thereby, it can supervise whether the (amount of arrival of goods + inventory) is over an inventory permissible dose at each process, and if excess is detected, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned information.
[0027] Moreover, in a production-control information output unit according to claim 6, if a production-control person inputs excess factor information with an input means when a (amount of arrival of goods + inventory) exceeds an inventory permissible dose, the excess factor information that it was inputted will be memorized by the storage means. And the 5th output means outputs the graph (it illustrates to drawing 1414) showing the inventory excess generating number of cases for every excess factor within a predetermined period (one week, one etc. month, etc.) based on the memorized excess factor information.
[0028] A production-control person can see the graph showing the inventory excess generating number of cases for every excess factor, and can recognize easily an excess factor with much inventory excess generating number of cases. In connection with this, priority can be set to order with much inventory excess generating number of cases, it can become possible to correspond so that an excess factor may be canceled at the high order of priority, an excess factor can be canceled effectively, and compaction of Production TAT can be aimed at.
[0029] in addition, above-mentioned the 1- especially the output method of the information by the 5th output means is not limited, and various kinds of output methods, such as a display on a display and a printed output to a form, can be used for it.
[0030]
[Embodiment of the Invention] The 1st operation gestalt corresponding to invention according to claim 1 is explained using a drawing below the [1st operation gestalt].
[0031] As shown in drawing 1 , the production status-control system 10 in this operation gestalt is constituted including the store 16 which remembers production status-control data to be the production status-control host 12 as a host computer of this system, the data-display terminal 18 which displays the various graphs created based on production status-control data, a warning message, etc., and the data input station 14 which was connected to the production status-control host 12 by the communication line etc., and was prepared for him for every process of semi-conductor manufacture.
[0032] The input and print-out of a production status-control system are shown in drawing 2 . As shown in this drawing 2 , when feeding a product into a production line first, from a data input station 14, information, such as a product name, a lot number, product quantity, a processing flow, and time for delivery, is inputted into the production status-control system 10 by the operator as notice information of an injection, and such information is registered as managed lot information in the production status-control system 10.
[0033] Information the information on the lot number by which processing initiation is carried out at the time of processing initiation of each process whenever each lot passes through a process, product quantity, a processing facility, etc. carried out [information] processing termination at the time of processing termination of each process, such as a lot number and product quantity, is inputted, respectively.
[0034] At the last shipment process, the information on the lot number shipped as notice-of-shipment information, the last excellent article quantity, the destination, etc. is inputted.
[0035] In addition, about the information on time of day, it is automatically set up by the production status-control system 10 by the calendar function and clock function which the production status-control host 12 had.
[0036] Based on the information inputted as mentioned above, as information which shows the situation of a production line, the amount of processing track records of each process, the amount of processing track records of each facility, and each process begin, an inventory (= (amount of arrival of goods + inventory)) etc. is computed, and each computed numeric value is compared with each planned quanity set up beforehand by the production status-control system 10. Moreover, about each lot, the production TAT at each process and the total production TAT from an injection to shipment are computed. Among these, about the production TAT from an injection to shipment, it is displayed on the data display terminal 18 as a histogram shown in drawing 3 , for example.

[0037] The production status-control system 10 of this operation gestalt computes the shipment to the (amount of arrival of goods + inventory) of every predetermined period (for example, one day) in each process, and displays the graph for every process which plotted this calculation result on the data display terminal 18.
[0038] The graph about a mold process is illustrated to drawing 4 . the production-control person of a semi-conductor product -- being such (amount of arrival of goods + inventory) -- the target shipment S1 can set up in the neighborhood the place where the graph which plotted the receiving shipment is seen, the place where a shipment is reaching the ceiling can be detected at even if it increases a (amount of arrival of goods + inventory), for example, this shipment is reaching the ceiling like drawing 4 , and a (amount of arrival of goods + inventory) can extract in the range in which this target shipment S1 is obtained. For example, a (amount of arrival of goods + inventory) can be set as I1. In addition, the above analysis may be performed only about the important process in a production line, although all processes may be followed.
[0039] With the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process offered from the production status-control system 10 of this operation gestalt as mentioned above, the production-control person of a semi-conductor product can acquire useful information, when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0040] The [2nd operation gestalt], next the 2nd operation gestalt corresponding to invention according to claim 2 are explained.
[0041] With this operation gestalt, as shown in drawing 7 , the production status-control system 10 mentioned above, the operating ratio managerial system 20 which performs management about the operating ratio of various facilities, and the TAT managerial system 40 which manages production TAT based on the information on the production status-control system 10 and the information on the operating ratio managerial system 20 are connected through the network 46. The store 44 which memorized TAT administrative data, and the data display terminal 42 which displays the various graphs concerning TAT management etc. are connected to the TAT managerial system 40.
[0042] As shown in drawing 5 , the above-mentioned operating ratio managerial system 20 The capacity utilization rate total server 22 and the storage 26 which memorized the data relevant to a capacity utilization rate, The data display terminal 24 which displays the various graphs concerning operating ratio management etc., It consists of facilities 34 of each process including the facility information receiving set 32 for every process which receives the information on an operation situation, computes the operating-time information on this facility 34 etc., and transmits operating-time information etc. to the capacity utilization rate total server 22 through a repeater 30 and a network 28.
[0043] Among these, the facility information receiving set 32 is constituted by the personal computer, and it is constituted so that an operator can input the non-worked factor of facility 34 from the keyboard. In the facility information receiving set 32, the processing track record time amount of facility 34, the downtime of facility 34, and a failure factor are summarized.
[0044] In addition, I have an operator input as a non-worked factor of facility 34 from facility 34 in the facility information receiving set 32 about information, such as a housekeeping substitute which cannot receive. Thereby, the classification divisions of a non-worked factor including a housekeeping substitute etc. are performed.
[0045] Moreover, at the time of the processing initiation in facility 34, and processing termination, the information which product information and quantity were inputted by the keyboard of the facility information receiving set 32, and was inputted from it is transmitted to the capacity utilization rate total server 22 by the operator. And in the capacity utilization rate total server 22, each information on the operating time of this facility 34, an operating ratio, the non-operating time, a worksheet, and processing hysteresis is summarized.
[0046] As mentioned above, as shown in drawing 6 , product information and quantity information are inputted into the operating ratio managerial system 20 at the time of the processing initiation in facility 34, and processing termination, and the non-worked factor at the time of a facility halt is directly inputted into it by the operator from facility 34. On the other hand, from the operating ratio managerial system 20, each information on the operating time of facility 34, an operating ratio, the non-operating time, a non-worked factor, a worksheet, and processing hysteresis is outputted.
[0047] The TAT managerial system 40 (drawing 7 R> 7) of this operation gestalt computes the information on a shipment over the (amount of arrival of goods + inventory) in each process from the information on the production status-control system 10, and the information on the above-mentioned operating ratio managerial system 20, and computes the information on the facility non-operating time over the (amount of arrival of goods + inventory) in each process from the operation information for every facility by which collection was carried out [above-mentioned]. Moreover, the information on the average production TAT over the (amount of arrival of goods + inventory) in each process is computed from the processing start time information and processing end time information by which collection was carried out [above-mentioned]. And the TAT managerial system 40 displays the graph which plotted the

shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT on the data display terminal 42 for every process.
[0048] To drawing 8 (C), the graph of the average production TAT of as opposed to a (amount of arrival of goods + inventory) for the graph of the facility non-operating time [as opposed to a (amount of arrival of goods + inventory) for the graph of the shipment to a (amount of arrival of goods + inventory)] is illustrated at drawing 8 (A) at drawing 8 (B), respectively.
[0049] The production-control person of a semi-conductor product detects the place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) from the graph of drawing 8 (A). The place which reduces a (amount of arrival of goods + inventory), and the facility non-operating time begins to increase from the graph of drawing 8 (B) can be detected, and the place which increases a (amount of arrival of goods + inventory), and the average production TAT begins to increase from the graph of drawing 8 (C) can be detected.
[0050] Thus, a production-control person can set up a (amount of arrival of goods + inventory) in the range which low level has the facility non-operating time and the average production TAT, and a shipment can secure above to some extent. For example, a (amount of arrival of goods + inventory) can be set as I2. thus, according to the 2nd operation gestalt, the average production TAT can be shortened, securing the above shipment to some extent suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.

[0051] The [3rd operation gestalt], next the 3rd operation gestalt corresponding to invention according to claim 3 are explained.
[0052] With this operation gestalt, how to summarize another information in the TAT managerial system 40 of drawing 7 is performed.
[0053] The TAT managerial system 40 acquires the information on the production TAT at each process from the processing start time information and processing end time information from the production status-control system 10, and acquires the information on the process reality working hours in each process from the operation information (time amount which is performing processing which relates to product production with this facility) for every facility from the operating ratio managerial system 20.
[0054] And by subtracting process reality working hours from the production TAT at each process, the TAT managerial system 40 acquires the non-[within a process] working hours in each process, and acquires the product transit time between processes between these two processes from the processing end time information on one process, and the processing start time information on the following process.
[0055] Furthermore, the TAT managerial system 40 displays each information on the process reality working hours in each above-mentioned process, non-[within a process] working hours, and the product transit time between processes on the data display terminal 42 for every process. Here, the bar graph for every process with which the unit of an axis of ordinate was made into time amount like drawing 9 may be displayed, and the unit of an axis of ordinate may display the bar graph for every process made into the ratio (%) like drawing 10 .
[0056] It becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each displayed process, non-[within a process] working hours, and the product transit time between processes (for example, is it in the PD between processes, or is in the facility within a process?). That is, according to this operation gestalt, useful information can be acquired when judging where the inhibition factor of production capacity is.
[0057] The [4th operation gestalt], next the 4th operation gestalt corresponding to invention according to claim 4 are explained.
[0058] As this operation gestalt also shows to drawing 7 , the production status-control system 10 and the operating ratio managerial system 20 are connected through the network 46. An operating ratio managerial system 20 classifies automatically with such a configuration at the non-operating time (man latency time) which depends the processing latency time of a product on the waiting for an operator based on the information about operation of the facility 34 managed itself, and the information on the unsettled inventory about each facility obtained from the production status-control system 10, and the non-operating time (object latency time) which are depended on the waiting for an unsettled inventory, and the information on the classified processing latency time outputs.
[0059] Hereafter, the manipulation routine performed by the capacity utilization rate total server 22 of the operating ratio managerial system 20 using drawing 12 is explained. The capacity utilization rate total server's 22 detection of a halt of any one facility 34 carries out activation initiation of the manipulation routine of drawing 12 R> 2.
[0060] At step 102 of drawing 12 , the contents of the halt factor signal from facility 34 are checked, and it judges whether the contents of this halt factor signal are failure of this facility 34 and fault in the following step 104. Here, if

the contents of the halt factor signal are failure of facility 34 and fault, it will progress to step 106 and the halt factor which corresponds based on the contents of the halt factor signal will be set up.
[0061] On the other hand, if the contents of the halt factor signal are neither failure of facility 34 nor fault at step 104, it will progress to step 108 and the unsettled inventory of the applicable facility 34 will be asked to the production status-control system 10.
[0062] The production status-control system 10 which received this inquiry answers the information on the unsettled inventory of the applicable facility 34 to the operating ratio managerial system 20.
[0063] And if the answerback from the production status-control system 10 is received at step 110, it will progress to step 112 and will judge whether there is any unsettled inventory based on these contents of answerback (unsettled inventory of the applicable facility 34), or there is nothing.
[0064] Here, since it can judge that an operator absence is the halt factor of the applicable facility 34 if there is an unsettled inventory of the applicable facility 34 (if an unsettled inventory is not 0), it progresses to step 114 and a man waiting state is set up as a halt factor. On the other hand, since it can judge that it is the halt factor of the applicable facility 34 that there is no unsettled inventory at step 112 if there is no unsettled inventory of the applicable facility 34 (if an unsettled inventory is 0), it progresses to step 116 and an object waiting state is set up as a halt factor.
[0065] The non-operating time of the applicable facility 34 can be classified with an automatically and sufficient precision according to the above manipulation routines at the non-operating time depended on the waiting for a man, and the non-operating time depended on the waiting for an object, without waiting for the input of the non-worked factor (are they the waiting for a man, or object waiting?) by the operator like before.
[0066] The operating ratio managerial system 20 displays the information on the facility non-operating time within the predetermined period classified according to the above-mentioned manipulation routine at the non-operating time depended on the waiting for a man, and the non-operating time depended on the waiting for an object (it illustrates to drawing 11) on the data display terminal 24.
[0067] Thereby, the manager of an operating ratio managerial system can see the above-mentioned information displayed on the data display terminal 24, and can check easily the ratio of the non-operating time depended on the waiting for a man, and the non-operating time depended on the waiting for an object. And when the ratio of the non-operating time depended on the waiting for an operator is high, the number of the operators stationed to Rhine is made to increase, and this information enables it to correspond improving PD control etc. exactly and promptly, when the ratio of the non-operating time depended on the waiting for an unsettled inventory is high.
[0068] The [5th operation gestalt], next the 5th operation gestalt corresponding to invention given in claims 5 and 6 are explained. The production status-control system 10 creates the graph showing the average value of the (amount of arrival of goods + inventory) of the graph showing the (amount of arrival of goods + inventory) and shipment according to day, and a predetermined period (for one month), and the average value of a shipment for every process, as shown in drawing 13 , and it expresses to the data display terminal 18 as this 5th operation gestalt.
[0069] A production status-control person checks the two above-mentioned kinds of graphs, determines the inventory allowed value of each process, and inputs from the keyboard of the data display terminal 18.
[0070] Thus, or it was inputted, when the inventory of each process exceeds to the inventory allowed value of each process set up beforehand, the production status-control system 10 displays a warning message on the data display terminal 18. In addition, an alarm sound generating function is given to the data display terminal 18, and an alarm sound may be generated while displaying a warning message at the time of an excess of an inventory.
[0071] Thereby, it can supervise whether the (amount of arrival of goods + inventory) in each process is over an inventory permissible dose, and if excess is detected, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned warning.
[0072] The production status-control person who heard the alarm or the inventory exceeded to the inventory allowed value of a process and it saw the warning message recognizes an excess of an inventory, and investigates the excess factor. as an excess factor -- the amount for example, in an applicable process which can be processed -- receiving (amount of arrival of goods + inventory) -- the failure of a facility which is, an operator's absence, etc. are mentioned.
[0073] And a production status-control person inputs the excess factor as results of an investigation into the production status-control system 10 from the keyboard of the data display terminal 18. In addition, the alter operation of an excess factor becomes easy by coding beforehand and preparing about the excess factor assumed, at this time. The information on an excess factor that it was inputted here is memorized by storage 16.
[0074] And the graph (it illustrates to drawing 14 R> 4) which expresses the inventory excess generating number of cases for every excess factor within a predetermined period with predetermined timing (it is one-time inspection timing etc. to once or a month in one week) based on the excess factor information memorized by then is displayed on the data

display terminal 18.
[0075] A production-control person can see the graph showing the inventory excess generating number of cases for every excess factor, and can recognize easily an excess factor with much inventory excess generating number of cases. In connection with this, priority can be set to order with much inventory excess generating number of cases, it can become possible to correspond so that an excess factor may be canceled at the high order of priority, an excess factor can be canceled effectively, and compaction of Production TAT can be aimed at.
[0076] In addition, the production status-control system 10 may express a warning message not only to the data display terminal 18 but to the data input station 14 of the process of relevance as the above-mentioned 5th operation gestalt, when the inventory of a certain process exceeds an allowed value. Thereby, the manager of the process of relevance can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned warning.
[0077]
[Effect of the Invention] Since the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process is outputted for every process according to invention according to claim 1 as explained above, the production-control person of a semi-conductor product can acquire useful information, when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0078] moreover, the average production TAT can be shortened, securing the above shipment to some extent, since the graph which plotted the shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT is outputted for every process according to invention according to claim 2 suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.
[0079] Moreover, since each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes is outputted for every process according to invention according to claim 3, it becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes.
[0080] Moreover, without waiting for the input of the non-worked factor about the facility non-operating time by the operator like before according to invention according to claim 4 Since the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator and the non-operating time depended on the waiting for an unsettled inventory can be acquired Based on this information, it becomes possible to correspond relocation of the operator to Rhine, an improvement of PD control, etc. exactly and promptly.
[0081] Moreover, if the (amount of arrival of goods + inventory) in at least one process is over an inventory permissible dose, since it will report that the (amount of arrival of goods + inventory) exceeded the inventory permissible dose at the process of relevance according to invention according to claim 5, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating.
[0082] Moreover, since the graph showing the inventory excess generating number of cases for every excess factor is outputted according to invention according to claim 6, a production-control person can see this graph and can recognize easily an excess factor with much inventory excess generating number of cases.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to a production-control information output unit, and relates to the production-control information output unit which outputs the various information for performing the production control of a semi-conductor in more detail.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] In recent years, the technique of a semi-conductor product is progressing very quickly, and the cycle of the technological innovation of a semi-conductor product is very short compared with other electric products. For this reason, about production of a semi-conductor product, it is very strong to shorten that production turn around time (for Production TAT to be called hereafter), and it has come to ask.
[0003] In the production status control of the present semi-conductor product, a certain same batch in a production facility was summarized as a lot, and the production TAT for every lot has been grasped based on the processing start time and processing end time of each process for every lot, and the inventory and the amount of processing track records of an unsettled product in each process are grasped.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] Since the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process is outputted for every process according to invention according to claim 1 as explained above, the production-control person of a semi-conductor product can acquire useful information, when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0078] moreover, the average production TAT can be shortened, securing the above shipment to some extent, since the graph which plotted the shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT is outputted for every process according to invention according to claim 2 suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.
[0079] Moreover, since each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes is outputted for every process according to invention according to claim 3, it becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes.
[0080] Moreover, without waiting for the input of the non-worked factor about the facility non-operating time by the operator like before according to invention according to claim 4 Since the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator and the non-operating time depended on the waiting for an unsettled inventory can be acquired Based on this information, it becomes possible to correspond relocation of the operator to Rhine, an improvement of PD control, etc. exactly and promptly.
[0081] Moreover, if the (amount of arrival of goods + inventory) in at least one process is over an inventory permissible dose, since it will report that the (amount of arrival of goods + inventory) exceeded the inventory permissible dose at the process of relevance according to invention according to claim 5, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating.
[0082] Moreover, since the graph showing the inventory excess generating number of cases for every excess factor is outputted according to invention according to claim 6, a production-control person can see this graph and can recognize easily an excess factor with much inventory excess generating number of cases.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the factor which influences the production TAT of a semi-conductor product was difficult for grasping correctly the various factors for every above-mentioned process for every process, only by grasping the production TAT for every lot like the production status control of the above-mentioned semi-conductor product, since it is various. Moreover, in order to aim at compaction of Production TAT, without reducing the shipment of a semi-conductor product, it was also difficult to acquire a solution with appropriate producing a semi-conductor product by the production [what] TAT.
[0005] This invention is accomplished in order to cancel the above-mentioned trouble, and it aims at offering the production-control information output unit which can output useful information when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, a production-control information output unit according to claim 1 The 1st information gathering means which collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semiconductor manufacture, It is characterized by having the 1st output means which outputs the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on the amount information of arrival of goods, inventory information, and shipment information which were collected by said 1st information gathering means.
[0007] Moreover, a production-control information output unit according to claim 2 The 2nd information gathering means which collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process in a production-control information output unit according to claim 1, The operation information for every facility collected by said 2nd information gathering means, processing start time information, It is based on said amount information of arrival of goods, inventory information, and shipment information at processing end time information and a list. It is characterized by having further the 2nd output means which outputs the graph which plotted three kinds of data, the shipment and the facility non-operating time over the sum of the amount of arrival of goods in each process, and an inventory, and average production turn around time, for every process.
[0008] Moreover, a production-control information output unit according to claim 3 is characterized by having further the 3rd output means which outputs each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes for every process based on the operation information, processing start time information, and processing end time information for said every facility in a production-control information output unit according to claim 2.
[0009] Moreover, a production-control information output unit according to claim 4 In a production-control information output unit according to claim 2 or 3, when a facility stops A judgment means to judge whether there is any unsettled inventory of the product which this facility processes, or there is nothing, The non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory when it sets up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator when there is an unsettled inventory and there is no unsettled inventory, and a setting means to set up, It is characterized by having further the 4th output means which outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory.
[0010] Moreover, a production-control information output unit according to claim 5 In a production-control information output unit given in any 1 term of claim 1 thru/or claim 4 An excess judging means to judge whether the inventory permissible dose for every process to which the sum of the amount of arrival of goods and an inventory was beforehand set at each process was exceeded, When the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose at at least one process, it is characterized by having further an information means to report that the sum of the amount of arrival of goods and an inventory exceeded the inventory permissible dose at the process of relevance.
[0011] Moreover, a production-control information output unit according to claim 6 The input means for inputting excess factor information in a production-control information output unit according to claim 5, when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose, It is characterized by having further a storage means to memorize the excess factor information that it was inputted, and the 5th output means which outputs the graph showing the inventory excess generating number of cases for every excess factor within a predetermined

period based on the memorized excess factor information.
[0012] In the production-control information output unit of the claim 1 above-mentioned publication, the 1st information gathering means collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture. In addition, as a predetermined period, one day, two days, or one week is sufficient. And from the amount information of arrival of goods, inventory information, and shipment information which were collected, the 1st output means acquires the information on a shipment over the sum (it is hereafter written as a (amount of arrival of goods + inventory)) of the amount of arrival of goods in a predetermined period, and an inventory, and outputs the graph (it illustrates to drawing 4) which plotted the shipment to the (amount of arrival of goods + inventory) in each process for every process.
[0013] Although the graph about a mold process was shown in drawing 4 The graph which plotted the receiving shipment is seen. the production-control person of a semi-conductor product -- being such (amount of arrival of goods + inventory) -- The place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) is detected. For example, the target shipment S1 can be set up in the neighborhood the place where this shipment is reaching the ceiling like drawing 4 , and a (amount of arrival of goods + inventory) can be extracted in the range in which this target shipment S1 is obtained (for example, a (amount of arrival of goods + inventory) can be set as I1).
[0014] Thus, the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process outputted by the 1st output means is information useful when aiming at compaction of production turn around time (production TAT), without reducing the shipment of a semi-conductor product. That is, according to invention according to claim 1, useful information can be outputted when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0015] Next, in a production-control information output unit according to claim 2, the 2nd information gathering means collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process. In addition, the hour entry and the downtime information on this facility that processing which relates to product production for example, with this facility is performed, its failure factor information, etc. are included in the operation information for every facility here.
[0016] And the 2nd output means acquires the information on the facility non-operating time over the (amount of arrival of goods + inventory) in each process from the operation information for every facility by which collection was carried out [above-mentioned] while acquiring the information on a shipment over the (amount of arrival of goods + inventory) in each process, as mentioned above based on the amount information of arrival of goods, inventory information, and shipment information. Moreover, the information on the average production TAT over the (amount of arrival of goods + inventory) in each process is acquired from the processing start time information and processing end time information by which collection was carried out [above-mentioned]. And the graph which plotted the shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT is outputted for every process.
[0017] Although the graph of the average production TAT of as opposed to a (amount of arrival of goods + inventory) for the graph of the facility non-operating time [as opposed to a (amount of arrival of goods + inventory) for the graph of the shipment to a (amount of arrival of goods + inventory)] was illustrated to drawing 8 (C) at drawing 8 (A) at drawing 8 (B), respectively The production-control person of a semi-conductor product detects the place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) from the graph of drawing 8 (A). The place which reduces a (amount of arrival of goods + inventory), and the facility non-operating time begins to increase from the graph of drawing 8 (B) can be detected, and the place which increases a (amount of arrival of goods + inventory), and the average production TAT begins to increase from the graph of drawing 8 (C) can be detected.
[0018] Thereby, a production-control person can set up a (amount of arrival of goods + inventory) in the place which can secure a shipment above to some extent, suppressing low the facility non-operating time and the average production TAT (for example, a (amount of arrival of goods + inventory) can be set as I2). thus, according to invention according to claim 2, the average production TAT can be shortened, securing the above shipment to some extent suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.

[0019] Next, in a production-control information output unit according to claim 3, the 3rd output means acquires the information on the production TAT at each process from processing start time information and processing end time information, and acquires the information on the process reality working hours in each process from the operation information (time amount which is performing processing which relates to product production with this facility) for

every facility. By subtracting process reality working hours from the production TAT at each process, the non-[within a process] working hours in each process are acquired. Moreover, the product transit time between processes between these two processes is acquired from the processing end time information on one process, and the processing start time information on the following process.

[0020] And the 3rd output means outputs each information on the process reality working hours in each process acquired by doing in this way, non-[within a process] working hours, and the product transit time between processes for every process. For example, the bar graph for every process with which the unit of an axis of ordinate was made into time amount like drawing 9 may be outputted, and the unit of an axis of ordinate may output the bar graph for every process made into the ratio (%) like drawing 10 . In addition, what is necessary is to specify beforehand whether it considers as the information on the process in front of migration, or it considers as the information on the process immediately after migration, and just to follow this convention in it about the product transit time between processes.

[0021] It becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes (for example, is it in the PD between processes, or is in the facility within a process?). That is, according to invention according to claim 3, useful information can be outputted when judging where the inhibition factor of production capacity is.

[0022] Next, in a production-control information output unit according to claim 4, a judgment means judges whether there is any unsettled inventory of the product which this facility processes, or there is nothing, when a facility stops. If a setting means will be set up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator if there is an unsettled inventory here, and there is no unsettled inventory, it will set up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory.

[0023] And the 4th output means outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory (it illustrates to drawing 11 R> 1).

[0024] The information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator and the non-operating time depended on the waiting for an unsettled inventory can be acquired without this waiting for the input of the non-worked factor (are they the waiting for an operator, or unsettled inventory waiting?) about the facility non-operating time by the operator like before. When the ratio of the non-operating time depended on the waiting for an operator is high, the number of the operators stationed to Rhine is made to increase, and this information enables it to correspond improving PD control etc. exactly and promptly, when the ratio of the non-operating time depended on the waiting for an unsettled inventory is high.

[0025] Next, in a production-control information output unit according to claim 5, it judges whether the excess judging means exceeded the inventory permissible dose for every process to which the (amount of arrival of goods + inventory) was set beforehand at each process. Here, if the (amount of arrival of goods + inventory) is over an inventory permissible dose at at least one process, an information means will report that the (amount of arrival of goods + inventory) exceeded the inventory permissible dose at the process of relevance.

[0026] Thereby, it can supervise whether the (amount of arrival of goods + inventory) is over an inventory permissible dose at each process, and if excess is detected, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned information.

[0027] Moreover, in a production-control information output unit according to claim 6, if a production-control person inputs excess factor information with an input means when a (amount of arrival of goods + inventory) exceeds an inventory permissible dose, the excess factor information that it was inputted will be memorized by the storage means. And the 5th output means outputs the graph (it illustrates to drawing 1414) showing the inventory excess generating number of cases for every excess factor within a predetermined period (one week, one etc. month, etc.) based on the memorized excess factor information.

[0028] A production-control person can see the graph showing the inventory excess generating number of cases for every excess factor, and can recognize easily an excess factor with much inventory excess generating number of cases. In connection with this, priority can be set to order with much inventory excess generating number of cases, it can become possible to correspond so that an excess factor may be canceled at the high order of priority, an excess factor can be canceled effectively, and compaction of Production TAT can be aimed at.

[0029] in addition, above-mentioned the 1- especially the output method of the information by the 5th output means is not limited, and various kinds of output methods, such as a display on a display and a printed output to a form, can be used for it.

[0030]
[Embodiment of the Invention] The 1st operation gestalt corresponding to invention according to claim 1 is explained using a drawing below the [1st operation gestalt].
[0031] As shown in drawing 1 , the production status-control system 10 in this operation gestalt is constituted including the store 16 which remembers production status-control data to be the production status-control host 12 as a host computer of this system, the data-display terminal 18 which displays the various graphs created based on production status-control data, a warning message, etc., and the data input station 14 which was connected to the production status-control host 12 by the communication line etc., and was prepared for him for every process of semi-conductor manufacture.
[0032] The input and print-out of a production status-control system are shown in drawing 2 . As shown in this drawing 2 , when feeding a product into a production line first, from a data input station 14, information, such as a product name, a lot number, product quantity, a processing flow, and time for delivery, is inputted into the production status-control system 10 by the operator as notice information of an injection, and such information is registered as managed lot information in the production status-control system 10.
[0033] Information the information on the lot number by which processing initiation is carried out at the time of processing initiation of each process whenever each lot passes through a process, product quantity, a processing facility, etc. carried out [information] processing termination at the time of processing termination of each process, such as a lot number and product quantity, is inputted, respectively.
[0034] At the last shipment process, the information on the lot number shipped as notice-of-shipment information, the last excellent article quantity, the destination, etc. is inputted.
[0035] In addition, about the information on time of day, it is automatically set up by the production status-control system 10 by the calendar function and clock function which the production status-control host 12 had.
[0036] Based on the information inputted as mentioned above, as information which shows the situation of a production line, the amount of processing track records of each process, the amount of processing track records of each facility, and each process begin, an inventory (= (amount of arrival of goods + inventory)) etc. is computed, and each computed numeric value is compared with each planned quanity set up beforehand by the production status-control system 10. Moreover, about each lot, the production TAT at each process and the total production TAT from an injection to shipment are computed. Among these, about the production TAT from an injection to shipment, it is displayed on the data display terminal 18 as a histogram shown in drawing 3 , for example.
[0037] The production status-control system 10 of this operation gestalt computes the shipment to the (amount of arrival of goods + inventory) of every predetermined period (for example, one day) in each process, and displays the graph for every process which plotted this calculation result on the data display terminal 18.
[0038] The graph about a mold process is illustrated to drawing 4 . the production-control person of a semi-conductor product -- being such (amount of arrival of goods + inventory) -- the target shipment S1 can set up in the neighborhood the place where the graph which plotted the receiving shipment is seen, the place where a shipment is reaching the ceiling can be detected at even if it increases a (amount of arrival of goods + inventory), for example, this shipment is reaching the ceiling like drawing 4 , and a (amount of arrival of goods + inventory) can extract in the range in which this target shipment S1 is obtained. For example, a (amount of arrival of goods + inventory) can be set as I1. In addition, the above analysis may be performed only about the important process in a production line, although all processes may be followed.
[0039] With the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process offered from the production status-control system 10 of this operation gestalt as mentioned above, the production-control person of a semi-conductor product can acquire useful information, when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[0040] The [2nd operation gestalt], next the 2nd operation gestalt corresponding to invention according to claim 2 are explained.
[0041] With this operation gestalt, as shown in drawing 7 , the production status-control system 10 mentioned above, the operating ratio managerial system 20 which performs management about the operating ratio of various facilities, and the TAT managerial system 40 which manages production TAT based on the information on the production status-control system 10 and the information on the operating ratio managerial system 20 are connected through the network 46. The store 44 which memorized TAT administrative data, and the data display terminal 42 which displays the various graphs concerning TAT management etc. are connected to the TAT managerial system 40.
[0042] As shown in drawing 5 , the above-mentioned operating ratio managerial system 20 The capacity utilization rate total server 22 and the storage 26 which memorized the data relevant to a capacity utilization rate, The data display

terminal 24 which displays the various graphs concerning operating ratio management etc., It consists of facilities 34 of each process including the facility information receiving set 32 for every process which receives the information on an operation situation, computes the operating-time information on this facility 34 etc., and transmits operating-time information etc. to the capacity utilization rate total server 22 through a repeater 30 and a network 28.
[0043] Among these, the facility information receiving set 32 is constituted by the personal computer, and it is constituted so that an operator can input the non-worked factor of facility 34 from the keyboard. In the facility information receiving set 32, the processing track record time amount of facility 34, the downtime of facility 34, and a failure factor are summarized.
[0044] In addition, I have an operator input as a non-worked factor of facility 34 from facility 34 in the facility information receiving set 32 about information, such as a housekeeping substitute which cannot receive. Thereby, the classification divisions of a non-worked factor including a housekeeping substitute etc. are performed.
[0045] Moreover, at the time of the processing initiation in facility 34, and processing termination, the information which product information and quantity were inputted by the keyboard of the facility information receiving set 32, and was inputted from it is transmitted to the capacity utilization rate total server 22 by the operator. And in the capacity utilization rate total server 22, each information on the operating time of this facility 34, an operating ratio, the non-operating time, a worksheet, and processing hysteresis is summarized.
[0046] As mentioned above, as shown in drawing 6 , product information and quantity information are inputted into the operating ratio managerial system 20 at the time of the processing initiation in facility 34, and processing termination, and the non-worked factor at the time of a facility halt is directly inputted into it by the operator from facility 34. On the other hand, from the operating ratio managerial system 20, each information on the operating time of facility 34, an operating ratio, the non-operating time, a non-worked factor, a worksheet, and processing hysteresis is outputted.
[0047] The TAT managerial system 40 (drawing 7 R> 7) of this operation gestalt computes the information on a shipment over the (amount of arrival of goods + inventory) in each process from the information on the production status-control system 10, and the information on the above-mentioned operating ratio managerial system 20, and computes the information on the facility non-operating time over the (amount of arrival of goods + inventory) in each process from the operation information for every facility by which collection was carried out [above-mentioned]. Moreover, the information on the average production TAT over the (amount of arrival of goods + inventory) in each process is computed from the processing start time information and processing end time information by which collection was carried out [above-mentioned]. And the TAT managerial system 40 displays the graph which plotted the shipment and the facility non-operating time over a (amount of arrival of goods + inventory), and three kinds of data of the average production TAT on the data display terminal 42 for every process.
[0048] To drawing 8 (C), the graph of the average production TAT of as opposed to a (amount of arrival of goods + inventory) for the graph of the facility non-operating time [as opposed to a (amount of arrival of goods + inventory) for the graph of the shipment to a (amount of arrival of goods + inventory)] is illustrated at drawing 8 (A) at drawing 8 (B), respectively.
[0049] The production-control person of a semi-conductor product detects the place where a shipment is reaching the ceiling even if it increases a (amount of arrival of goods + inventory) from the graph of drawing 8 (A). The place which reduces a (amount of arrival of goods + inventory), and the facility non-operating time begins to increase from the graph of drawing 8 (B) can be detected, and the place which increases a (amount of arrival of goods + inventory), and the average production TAT begins to increase from the graph of drawing 8 (C) can be detected.
[0050] Thus, a production-control person can set up a (amount of arrival of goods + inventory) in the range which low level has the facility non-operating time and the average production TAT, and a shipment can secure above to some extent. For example, a (amount of arrival of goods + inventory) can be set as I2. thus, according to the 2nd operation gestalt, the average production TAT can be shortened, securing the above shipment to some extent suppressing the facility non-operating time low -- being proper (amount of arrival of goods + inventory) -- it becomes possible to set up.

[0051] The [3rd operation gestalt], next the 3rd operation gestalt corresponding to invention according to claim 3 are explained.
[0052] With this operation gestalt, how to summarize another information in the TAT managerial system 40 of drawing 7 is performed.
[0053] The TAT managerial system 40 acquires the information on the production TAT at each process from the processing start time information and processing end time information from the production status-control system 10, and acquires the information on the process reality working hours in each process from the operation information (time amount which is performing processing which relates to product production with this facility) for every facility from the

operating ratio managerial system 20.
[0054] And by subtracting process reality working hours from the production TAT at each process, the TAT managerial system 40 acquires the non-[within a process] working hours in each process, and acquires the product transit time between processes between these two processes from the processing end time information on one process, and the processing start time information on the following process.
[0055] Furthermore, the TAT managerial system 40 displays each information on the process reality working hours in each above-mentioned process, non-[within a process] working hours, and the product transit time between processes on the data display terminal 42 for every process. Here, the bar graph for every process with which the unit of an axis of ordinate was made into time amount like drawing 9 may be displayed, and the unit of an axis of ordinate may display the bar graph for every process made into the ratio (%) like drawing 10 .
[0056] It becomes easy to judge where the production-control person of a semi-conductor product has the inhibition factor of production capacity from each information on the process reality working hours in each displayed process, non-[within a process] working hours, and the product transit time between processes (for example, is it in the PD between processes, or is in the facility within a process?). That is, according to this operation gestalt, useful information can be acquired when judging where the inhibition factor of production capacity is.
[0057] The [4th operation gestalt], next the 4th operation gestalt corresponding to invention according to claim 4 are explained.
[0058] As this operation gestalt also shows to drawing 7 , the production status-control system 10 and the operating ratio managerial system 20 are connected through the network 46. An operating ratio managerial system 20 classifies automatically with such a configuration at the non-operating time (man latency time) which depends the processing latency time of a product on the waiting for an operator based on the information about operation of the facility 34 managed itself, and the information on the unsettled inventory about each facility obtained from the production status-control system 10, and the non-operating time (object latency time) which are depended on the waiting for an unsettled inventory, and the information on the classified processing latency time outputs.
[0059] Hereafter, the manipulation routine performed by the capacity utilization rate total server 22 of the operating ratio managerial system 20 using drawing 12 is explained. The capacity utilization rate total server's 22 detection of a halt of any one facility 34 carries out activation initiation of the manipulation routine of drawing 12 R> 2.
[0060] At step 102 of drawing 12 , the contents of the halt factor signal from facility 34 are checked, and it judges whether the contents of this halt factor signal are failure of this facility 34 and fault in the following step 104. Here, if the contents of the halt factor signal are failure of facility 34 and fault, it will progress to step 106 and the halt factor which corresponds based on the contents of the halt factor signal will be set up.
[0061] On the other hand, if the contents of the halt factor signal are neither failure of facility 34 nor fault at step 104, it will progress to step 108 and the unsettled inventory of the applicable facility 34 will be asked to the production status-control system 10.
[0062] The production status-control system 10 which received this inquiry answers the information on the unsettled inventory of the applicable facility 34 to the operating ratio managerial system 20.
[0063] And if the answerback from the production status-control system 10 is received at step 110, it will progress to step 112 and will judge whether there is any unsettled inventory based on these contents of answerback (unsettled inventory of the applicable facility 34), or there is nothing.
[0064] Here, since it can judge that an operator absence is the halt factor of the applicable facility 34 if there is an unsettled inventory of the applicable facility 34 (if an unsettled inventory is not 0), it progresses to step 114 and a man waiting state is set up as a halt factor. On the other hand, since it can judge that it is the halt factor of the applicable facility 34 that there is no unsettled inventory at step 112 if there is no unsettled inventory of the applicable facility 34 (if an unsettled inventory is 0), it progresses to step 116 and an object waiting state is set up as a halt factor.
[0065] The non-operating time of the applicable facility 34 can be classified with an automatically and sufficient precision according to the above manipulation routines at the non-operating time depended on the waiting for a man, and the non-operating time depended on the waiting for an object, without waiting for the input of the non-worked factor (are they the waiting for a man, or object waiting?) by the operator like before.
[0066] The operating ratio managerial system 20 displays the information on the facility non-operating time within the predetermined period classified according to the above-mentioned manipulation routine at the non-operating time depended on the waiting for a man, and the non-operating time depended on the waiting for an object (it illustrates to drawing 11) on the data display terminal 24.
[0067] Thereby, the manager of an operating ratio managerial system can see the above-mentioned information displayed on the data display terminal 24, and can check easily the ratio of the non-operating time depended on the

waiting for a man, and the non-operating time depended on the waiting for an object. And when the ratio of the non-operating time depended on the waiting for an operator is high, the number of the operators stationed to Rhine is made to increase, and this information enables it to correspond improving PD control etc. exactly and promptly, when the ratio of the non-operating time depended on the waiting for an unsettled inventory is high.

[0068] The [5th operation gestalt], next the 5th operation gestalt corresponding to invention given in claims 5 and 6 are explained. The production status-control system 10 creates the graph showing the average value of the (amount of arrival of goods + inventory) of the graph showing the (amount of arrival of goods + inventory) and shipment according to day, and a predetermined period (for one month), and the average value of a shipment for every process, as shown in drawing 13 , and it expresses to the data display terminal 18 as this 5th operation gestalt.

[0069] A production status-control person checks the two above-mentioned kinds of graphs, determines the inventory allowed value of each process, and inputs from the keyboard of the data display terminal 18.

[0070] Thus, or it was inputted, when the inventory of each process exceeds to the inventory allowed value of each process set up beforehand, the production status-control system 10 displays a warning message on the data display terminal 18. In addition, an alarm sound generating function is given to the data display terminal 18, and an alarm sound may be generated while displaying a warning message at the time of an excess of an inventory.

[0071] Thereby, it can supervise whether the (amount of arrival of goods + inventory) in each process is over an inventory permissible dose, and if excess is detected, a production-control person can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned warning.

[0072] The production status-control person who heard the alarm or the inventory exceeded to the inventory allowed value of a process and it saw the warning message recognizes an excess of an inventory, and investigates the excess factor. as an excess factor -- the amount for example, in an applicable process which can be processed -- receiving (amount of arrival of goods + inventory) -- the failure of a facility which is, an operator's absence, etc. are mentioned.

[0073] And a production status-control person inputs the excess factor as results of an investigation into the production status-control system 10 from the keyboard of the data display terminal 18. In addition, the alter operation of an excess factor becomes easy by coding beforehand and preparing about the excess factor assumed, at this time. The information on an excess factor that it was inputted here is memorized by storage 16.

[0074] And the graph (it illustrates to drawing 14 R> 4) which expresses the inventory excess generating number of cases for every excess factor within a predetermined period with predetermined timing (it is one-time inspection timing etc. to once or a month in one week) based on the excess factor information memorized by then is displayed on the data display terminal 18.

[0075] A production-control person can see the graph showing the inventory excess generating number of cases for every excess factor, and can recognize easily an excess factor with much inventory excess generating number of cases. In connection with this, priority can be set to order with much inventory excess generating number of cases, it can become possible to correspond so that an excess factor may be canceled at the high order of priority, an excess factor can be canceled effectively, and compaction of Production TAT can be aimed at.

[0076] In addition, the production status-control system 10 may express a warning message not only to the data display terminal 18 but to the data input station 14 of the process of relevance as the above-mentioned 5th operation gestalt, when the inventory of a certain process exceeds an allowed value. Thereby, the manager of the process of relevance can recognize prompt (amount of arrival of goods + inventory) excess generating by the above-mentioned warning.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] They are a semi-conductor production line and the whole production status-control system block diagram.
[Drawing 2] It is drawing showing the input and print-out of a production status-control system.
[Drawing 3] It is the histogram of the production TAT of a semi-conductor production line.
[Drawing 4] It is the graph which plotted the data (shipment) for every (amount of arrival of goods + inventory) process.
[Drawing 5] It is the whole operating ratio collecting-system block diagram.
[Drawing 6] It is drawing showing the input and print-out of an operating ratio collecting system.
[Drawing 7] It is the whole TAT managerial system block diagram.
[Drawing 8] (A) is the graph which plotted the data (shipment) for every (amount of arrival of goods + inventory) process, (B) is the graph which plotted the data (non-operating time of a facility) for every (amount of arrival of goods + inventory) process, and (C) is the graph which plotted the data (average production TAT) for every (amount of arrival of goods + inventory) process.
[Drawing 9] It is the bar graph which shows the classification of the product residence time for every process which made the unit of an axis of ordinate time amount.
[Drawing 10] It is the bar graph which shows the classification of the product residence time for every process which carried out the unit of an axis of ordinate comparatively.
[Drawing 11] It is the bar graph which shows the classification of the non-operating time of a facility.
[Drawing 12] It is the flow chart showing the manipulation routine of processing which divides the non-worked factor of a facility into the waiting for a man, and object waiting.
[Drawing 13] It is the graph which is every process (amount of arrival of goods + inventory), and shows Japanese another track record value and the average of a shipment.
[Drawing 14] It is the pareto showing the excess generating number of cases for every inventory excess factor.
[Description of Notations]
10 Production Status-Control System
12 Production Status-Control Host
18, 24, 42 Data display terminal
20 Operating Ratio Managerial System
22 Operating Ratio Total Server
40 TAT Managerial System

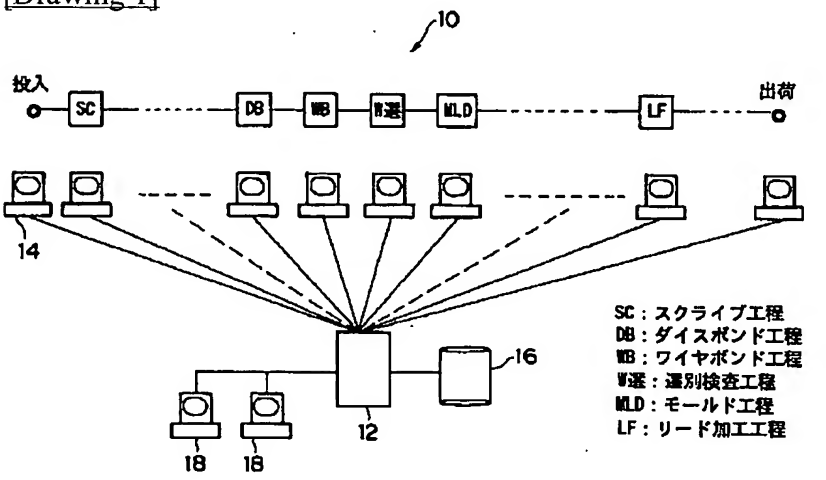
[Translation done.]

* NOTICES *

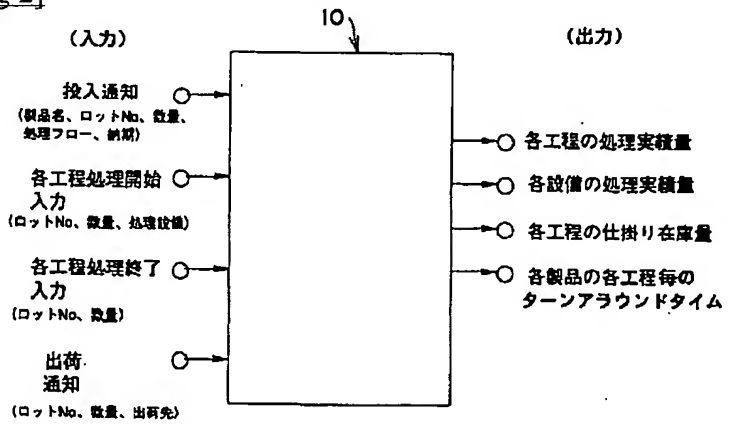
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

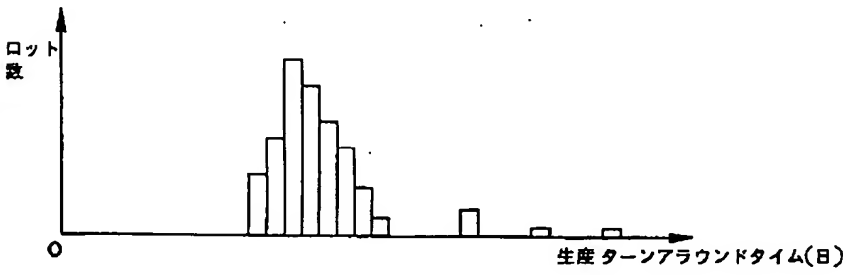
[Drawing 1]



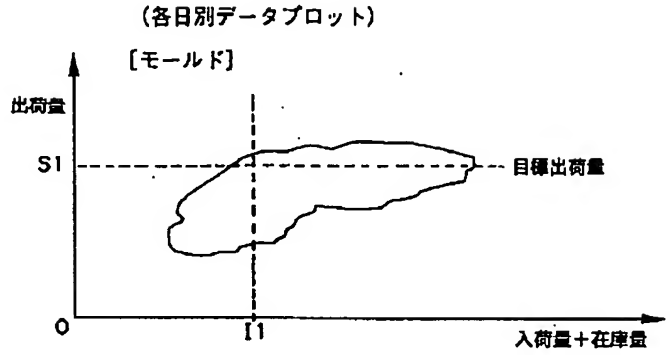
[Drawing 2]



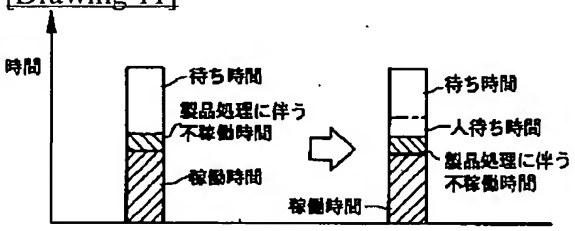
[Drawing 3]



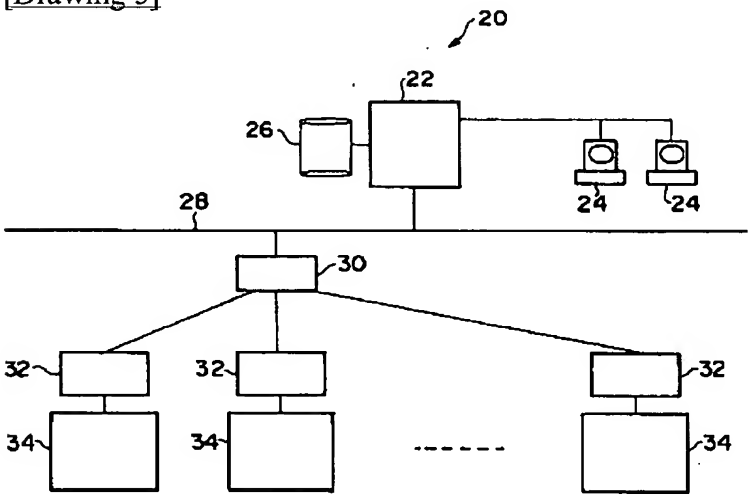
[Drawing 4]



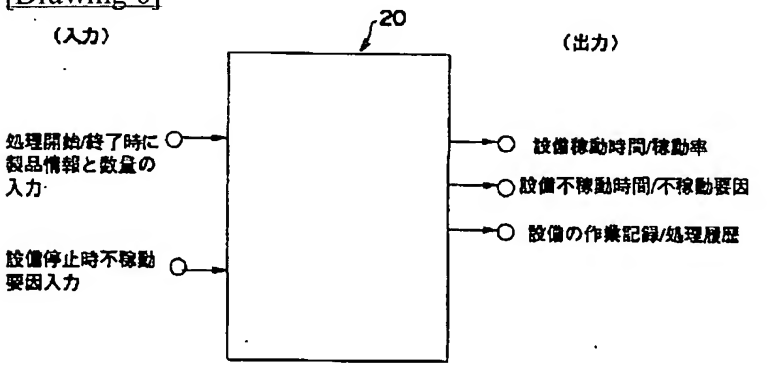
[Drawing 11]



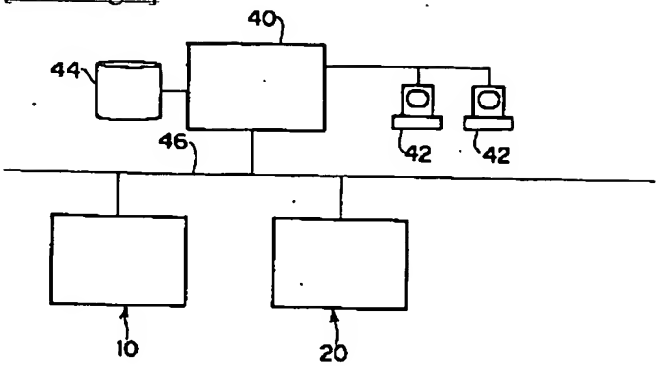
[Drawing 5]



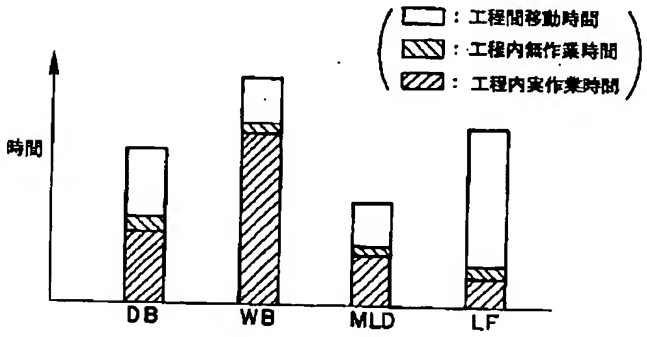
[Drawing 6]



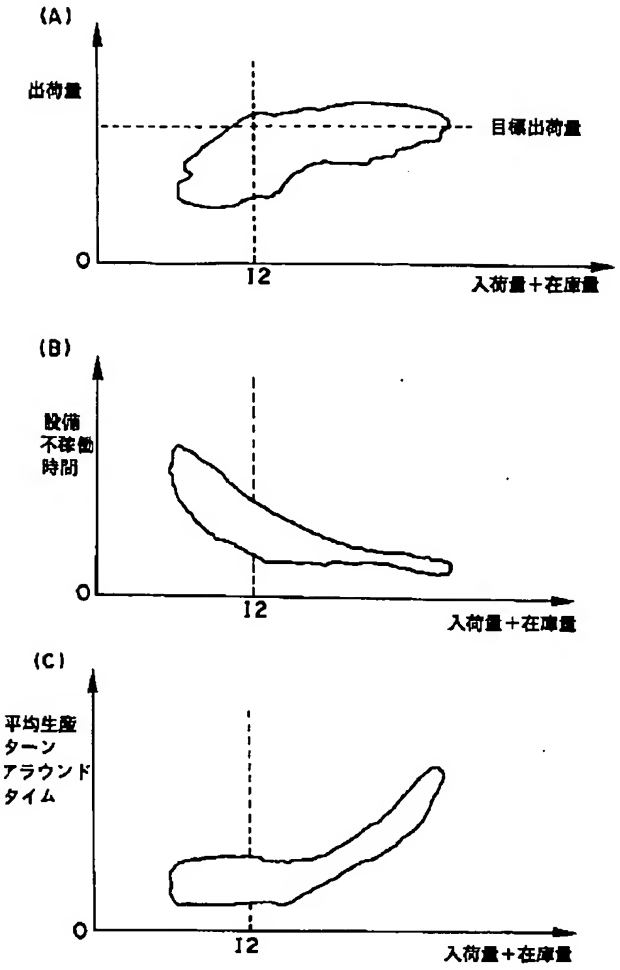
[Drawing 7]



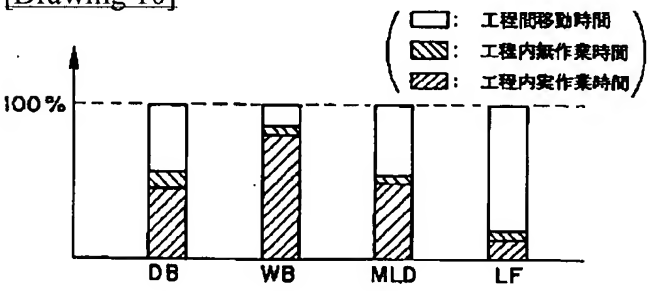
[Drawing 9]



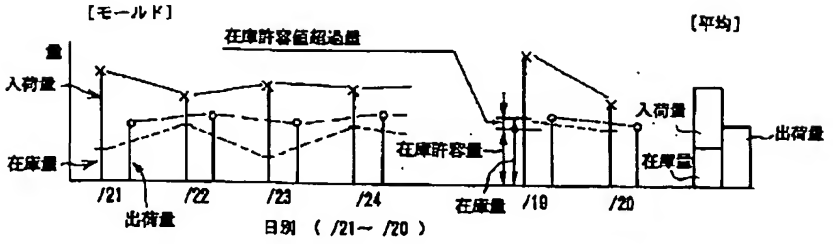
[Drawing 8]



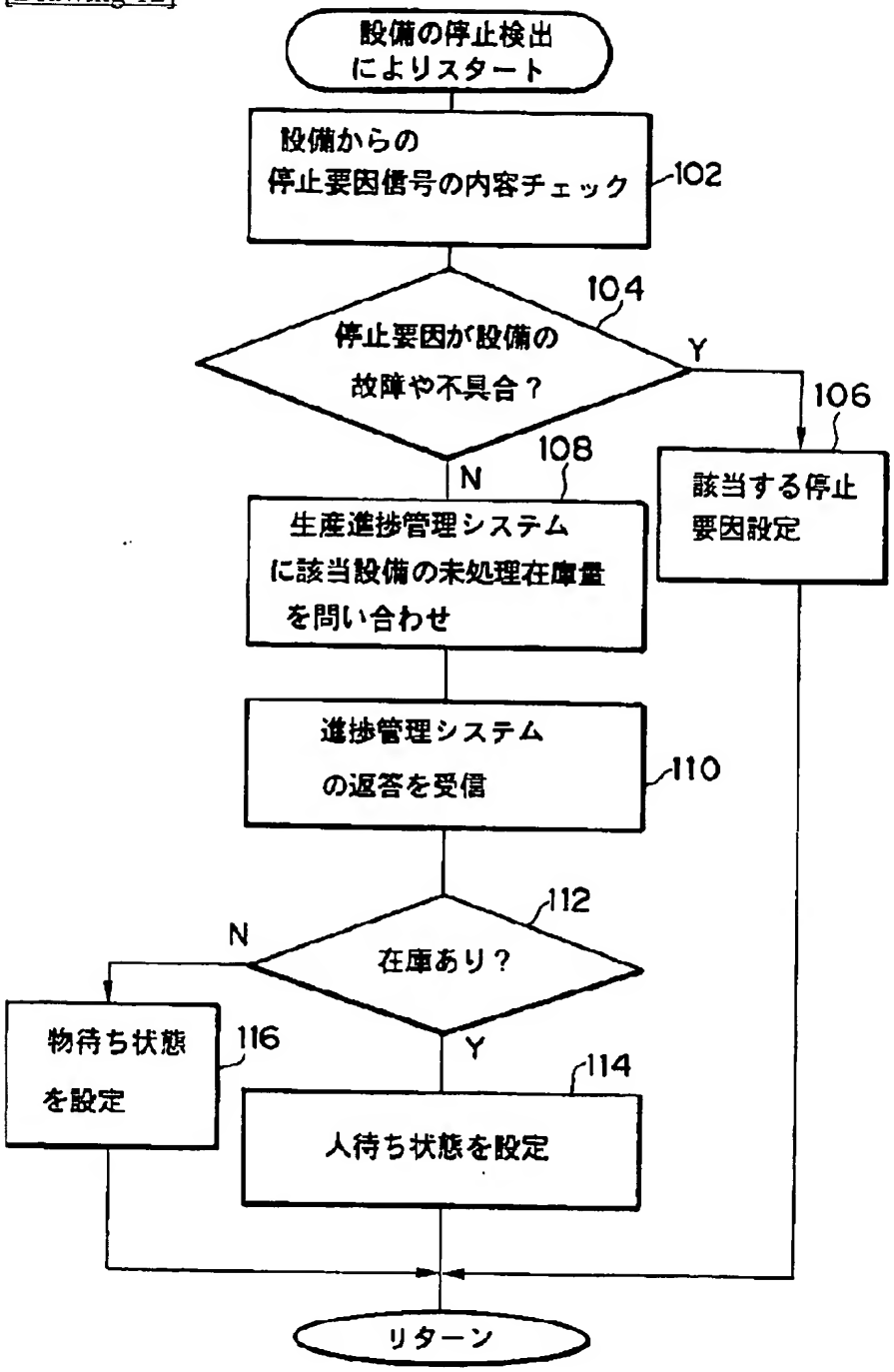
[Drawing 10]



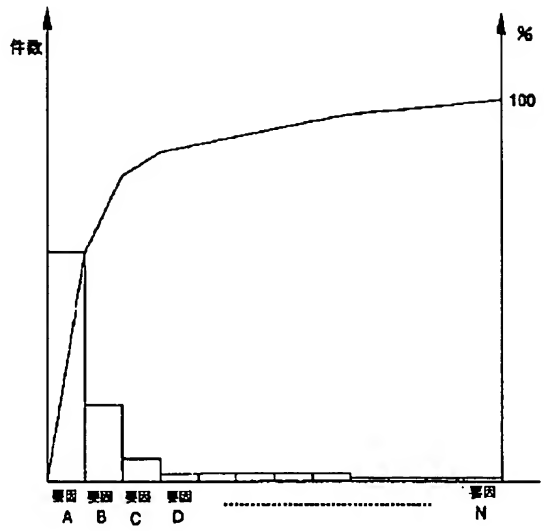
[Drawing 13]



[Drawing 12]



[Drawing 14]



[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Section partition] The 3rd partition of the 6th section
[Publication date] September 2, Heisei 17 (2005. 9.2)

[Publication No.] JP,11-296208,A
[Date of Publication] October 29, Heisei 11 (1999. 10.29)
[Application number] Japanese Patent Application No. 10-97126
[The 7th edition of International Patent Classification]

G05B 15/02
H01L 21/02
// B23Q 41/08

[FI]

G05B 15/02 Z
H01L 21/02 Z
B23Q 41/08 Z

[Procedure revision]
[Filing Date] March 8, Heisei 17 (2005. 3.8)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] The name of invention
[Method of Amendment] Modification
[The contents of amendment]
[Title of the Invention] A production-control information output unit and a production-control information output method
[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim
[Method of Amendment] Modification
[The contents of amendment]
[Claim(s)]
[Claim 1]
The 1st information gathering means which collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture,
The 1st output means which outputs the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on the amount information of arrival of goods, inventory information, and shipment information which were collected by said 1st information gathering means,
The production-control information output unit which ****.
[Claim 2]
The 2nd information gathering means which collects the operation information for every facility used at each process, the processing start time information on each process, and the processing end time information on each process,

The 2nd output means which outputs the graph which plotted three kinds of data, the shipment and the facility non-operating time over the sum of the amount of arrival of goods in each process, and an inventory, and average production turn around time, for every process based on said amount information of arrival of goods, inventory information, and shipment information to the operation information for every facility collected by said 2nd information gathering means, processing start time information, processing end time information, and a list,
The production-control information output unit according to claim 1 which it has in a pan.
[Claim 3]
The production-control information output unit according to claim 2 which has further the 3rd output means which outputs each information on the process reality working hours in each process, non-[within a process] working hours, and the product transit time between processes for every process based on the operation information, processing start time information, and processing end time information for said every facility.
[Claim 4]
A judgment means to judge whether there is any unsettled inventory of the product which this facility processes when a facility stops, or there is nothing,
The non-operating time which depends the facility non-operating time in the time concerned on the waiting for an unsettled inventory when it sets up with the non-operating time which depends the facility non-operating time in the time concerned on the waiting for an operator when there is an unsettled inventory and there is no unsettled inventory, and a setting means to set up,
The 4th output means which outputs the information on the facility non-operating time within the predetermined period classified at the non-operating time depended on the waiting for an operator, and the non-operating time depended on the waiting for an unsettled inventory,
The production-control information output unit according to claim 2 or 3 which it has in a pan.
[Claim 5]
An excess judging means to judge whether the inventory permissible dose for every process to which the sum of the amount of arrival of goods and an inventory was beforehand set at each process was exceeded,
An information means to report that the sum of the amount of arrival of goods and an inventory exceeded the inventory permissible dose at the process of relevance when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose at at least one process,
A production-control information output unit given in any 1 term of claim 1 which it has in a pan thru/or claim 4.
[Claim 6]
The input means for inputting excess factor information, when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose,
A storage means to memorize the excess factor information that it was inputted,
The 5th output means which outputs the graph showing the inventory excess generating number of cases for every excess factor within a predetermined period based on the memorized excess factor information,
The production-control information output unit according to claim 5 which it has in a pan.
[Claim 7]
The amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture are collected,
The production-control information output method characterized by outputting the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on said collected amount information of arrival of goods, inventory information, and shipment information.
[Procedure amendment 3]
[Document to be Amended] Specification
[Item(s) to be Amended] 0001
[Method of Amendment] Modification
[The contents of amendment]
[0001]
[Field of the Invention]
This invention relates to a production-control information output unit and a production-control information output method, and relates to the production-control information output unit and production-control information output method which output the various information for performing the production control of a semi-conductor in more detail.
[Procedure amendment 4]
[Document to be Amended] Specification

[Item(s) to be Amended] 0005
[Method of Amendment] Modification
[The contents of amendment]
[0005]
This invention is accomplished in order to cancel the above-mentioned trouble, and it aims at offering the production-control information output unit and production-control information output method which can output useful information when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.
[Procedure amendment 5]
[Document to be Amended] Specification
[Item(s) to be Amended] 0011
[Method of Amendment] Modification
[The contents of amendment]
[0011]
Moreover, a production-control information output unit according to claim 6 The input means for inputting excess factor information in a production-control information output unit according to claim 5, when the sum of the amount of arrival of goods and an inventory exceeds an inventory permissible dose, It is characterized by having further a storage means to memorize the excess factor information that it was inputted, and the 5th output means which outputs the graph showing the inventory excess generating number of cases for every excess factor within a predetermined period based on the memorized excess factor information.
Moreover, a production-control information output method according to claim 7 collects the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture, and is characterized by outputting the graph which plotted the shipment to the sum of the amount of arrival of goods in each process, and an inventory for every process based on said collected amount information of arrival of goods, inventory information, and shipment information.
[Procedure amendment 6]
[Document to be Amended] Specification
[Item(s) to be Amended] 0029
[Method of Amendment] Modification
[The contents of amendment]
[0029]
in addition, above-mentioned the 1- especially the output method of the information by the 5th output means is not limited, and various kinds of output methods, such as a display on a display and a printed output to a form, can be used for it.
Moreover, in a production-control information output method according to claim 7, the amount information of arrival of goods, inventory information, and shipment information for every predetermined period about each process of semi-conductor manufacture are collected, and the graph which plotted the shipment to the sum of the amount of arrival of goods in each process and an inventory is outputted for every process based on the amount information of arrival of goods, inventory information, and shipment information which were collected.
[Procedure amendment 7]
[Document to be Amended] Specification
[Item(s) to be Amended] 0030
[Method of Amendment] Modification
[The contents of amendment]
[0030]
[Embodiment of the Invention]
[The 1st operation gestalt]
Hereafter, the 1st operation gestalt corresponding to invention of a publication is explained to claims 1 and 7 using a drawing.
[Procedure amendment 8]
[Document to be Amended] Specification
[Item(s) to be Amended] 0082
[Method of Amendment] Modification
[The contents of amendment]
[0082]

Moreover, since the graph showing the inventory excess generating number of cases for every excess factor is outputted according to invention according to claim 6, a production-control person can see this graph and can recognize easily an excess factor with much inventory excess generating number of cases.
Moreover, since the graph which plotted the shipment to the (amount of arrival of goods + inventory) in each process is outputted for every process according to invention according to claim 7, the production-control person of a semi-conductor product can acquire useful information, when aiming at compaction of Production TAT, without reducing the shipment of a semi-conductor product.

[Translation done.]